Application No.: 10/765,494
Amendment Dated: October 6, 2005
Reply to the Office Action of July 6, 2005

Amendments to the Specification

Please replace paragraph [1017] with the following paragraph:

[1017] While embodiments discussed herein are primarily directed to a barge tug, persons of skill will recognize that the invention may be applied to any type of vehicle such as ships, trucks, locomotives, and airplanes. It works especially well for vehicles operated by users over relatively long, monotonous trips, which makes them susceptible to falling asleep while in control of the vehicle. Similarly, with embodiments discussed herein, a tug's steering column is monitored as the vehicle control that is continually adjusted under normal operation. However, invention embodiments are certainly not limited to monitoring this control. Any vehicle control that is adjusted regularly enough under normal operation so that the failure of it to be adjusted can be detected soon enough to prevent an accident may be suitable for monitoring. Thus, any aspect of steering or some other parameter may be monitored for boats, wheeled vehicles, or ~~aircrafts~~ aircraft.

Please replace paragraph 1021 with the following paragraph:

[1021] Figure 2 shows a logical block diagram of a collision avoidance system that is implemented with the system of Figure 1 and with the circuits of Figures 3A-3I described below. (The description of this diagram is a good introduction to the circuits of Figures 3A-3I, which form an overall circuit that substantially performs the functions described with this diagram. However, it should be recognized that there are numerous ways to implement the functions and blocks described herein, and thus, the invention is not so limited.) The block system of Figure 2 generally includes sensor blocks 202, 204, NOR gate 206, a first timer 208, a first alarm 210, an inverter 212, a second timer 214, a second alarm 216, and disable switches 218. The first sensor

202, second sensor 204, and disable switches 218 are each connected as inputs to the NOR gate 206, whose output is connected to the first timer block 208, which has an active Low input. Outputs of the first timer 208 are connected to the first alarm 210 and to the input of inverter 212, whose output is connected to the second timer 214 at its active low input. Finally, an output of the second timer 214 is connected to the second alarm 216. Upon receiving an active signal from either sensor 202, sensor 204, or a disable switch from switch block 218, NOR gate 206 applies a Low signal to the active Low input at the first timer 208. When this input is Low, the first timer 208 resets itself. Accordingly, the first timer 208 is not allowed to time out if repeatedly reset by one of the sensors 202/204 within the first timer's time period or if a disable switch provides it with an active signal. As long as the first timer 208 does not ~~"time-out,"~~ "time out," it provides at its output to inverter 212 a High signal causing the inverter to apply a Low signal at the active Low input of the second timer 214. As with the first timer, as long as this input is Low, it can not start counting (i.e., it is perpetually reset) and thus can not activate the second (and main) alarm 216. On the other hand, if upon being activated by the first timer 208 providing a Low at its output and causing the inverter 212 to input a High at the input of the second timer 214, the second timer 214 will "count" for its second timer set amount of time, and if it times out, it then activates the second alarm 216, which indicates an all-out alarm situation. In the next section, with reference to Figures 3A to 3I, a particular circuit is described for implementing this block system.

Please replace paragraph 1025 with the following paragraph:

[1025] Figure 3E shows connector J4, which is used to connect a 12VDC power source 131 from the tug to the main circuit module 105. As shown, contact 3 connects to ground, and contact 1 connects to the 12 Volt source.

Please replace paragraph 1026 with the following paragraph:

[1026] Figure 3G schematically shows the circuit in the wheel house module 120. It includes a piezoelectric buzzer labeled PIEZO connected between contacts 1 and 2. It also includes a test switch connected to contacts 3 and 4, along with a push button docking switch, S6, connected between contacts 5 and 6 and a 100 Ohm resistor ~~R3~~ R53 connected in series with LED indicator LED1 between contacts 1 and 5. Functioning as the first (or wheel house alarm), the piezoelectric buzzer activates when contact 2 goes low, which occurs when the first timer (IC4 in Figure 3B discussed below) times out. (This is so because when J3 is connected to its counterpart on the main circuit module, a 9 VDC supply is applied to contact 1.) Test switch S5 functions to test the main alarm system 140. When it is closed, it connects contacts 3 and 4 of connector J3, which causes an activating ground to be applied to the main alarm connector J5, contact J3 (see Figures 3C and 3I)causing the main alarm 140 to be sounded. Finally, when depressed, docking switch S6 causes the first timer to be deactivated until a steering sensor (OC1 or OC2) generates a pulse indicating that a steering adjustment has been made. It works by forcing a Low at the output of a bistable circuit 313 (Figure 3B) discussed below, which deactivates the first timer. When the docking switch S6 is depressed and the first timer is deactivated, LED1 turns on thereby indicating that the alarm system is inactive.